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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,078	01/17/2002	Toshiyuki Okumura	204552016410	6610
25227	7590	12/23/2004	EXAMINER	
MORRISON & FOERSTER LLP 1650 TYSONS BOULEVARD SUITE 300 MCLEAN, VA 22102			JACKSON, CORNELIUS H	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/050,078

Applicant(s)

OKUMURA, TOSHIYUKI

Examiner

Cornelius H. Jackson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19,22-24,30 and 34-60 is/are pending in the application.
- 4a) Of the above claim(s) 49-58 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19,22-24,30,37-41 and 59 is/are allowed.
- 6) ☒ Claim(s) 34-36,42-48 and 60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/17/02
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Acknowledgment is made that applicant's Amendment, filed on 30 August 2004, has been entered. Upon entrance of the Amendment, claims 19 and 30 were amended, claims 16-18, 20, 21, 25-29 and 31-33 were canceled, and claims 37-60 were added. Claims 19, 22-24, 30 and 34-60 are now pending in the current application.

### ***Election/Restrictions***

2. Newly submitted claims 49-58 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Independent claim 49 requires an active layer consisting of two quantum well layers and one barrier layer and fails to require either the barrier layer to have a layer thickness of 4 nm or less or a ridge portion and a planar portion on opposite sides of the ridge portion.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 49-58 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

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### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Drawings***

4. Figures 19-21 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Allowable Subject Matter***

5. Claims 19, 22-24, 30, 37-41 and 59 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

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Regarding claims 22-24, prior art fails to disclose, teach, or suggest, alone or in combination, a gallium nitride semiconductor device as claimed having cladding layer with a ridge surface and a planar surface and an active layer containing two to four quantum well layers and one to three barrier layers respectively, each interposed between the quantum well layers, and the one or each barrier layer has a layer thickness of 4 nm or less.

Regarding claims 19 and 30, prior art fails to disclose, teach, or suggest, alone or in combination, a gallium nitride semiconductor device as claimed being a self-oscillating semiconductor laser device, **see specification, page 26, lines 3-10**, and having an active layer containing two to four quantum well layers and one to three barrier layers respectively, each interposed between the quantum well layers, and the one or each barrier layer has a layer thickness of 4 nm or less.

Regarding claim 59, prior art fails to disclose, teach, or suggest, alone or in combination, a gallium nitride semiconductor device as claimed having a p-type cladding layer that forms at least part of a ridge structure and an active layer containing two to four quantum well layers and one to three barrier layers respectively, each interposed between the quantum well layers, and the one or each barrier layer has a layer thickness of 4 nm or less.

7. The indicated allowability of claims 34-36 is withdrawn in view of the newly discovered reference(s) to Nakamura et al. (Applicant's Admitted Prior Art Figs. 19 and 20). Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 34-36, 42-48 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (Applicant's Admitted Prior Art Figs. 19 and 20).

Regarding claims 34 and 60, Nakamura et al. disclose a gallium nitride semiconductor light emitting device **Figs. 19 and 20** having emission wavelengths within a band corresponding to ultraviolet to green, **see specification, page 1, lines 15-23**, comprising a semiconductor substrate **101**, an active layer **107** having a quantum well structure and made of nitride semiconductor containing at least indium and gallium, **see specification, page 2, lines 3-5**, and a first/n-type cladding layer **105** and a second/p-type cladding layer **110** for sandwiching/(between which) the active layer **107** therebetween/(is disposed), wherein the active layer forms an oscillating section of the semiconductor laser device and consists of two to four quantum well layers and one to three barrier layers each interposed between the quantum well layers, and wherein one of the first and second cladding layers is a p-type layer, and the p-type cladding layer has a ridge portion/structure and a planar portion on opposite sides of the ridge portion/structure, **see specification, page 1, line 15-page 2, line 14**.

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Regarding claim 35, Nakamura et al. disclose the ridge has a width of about 1  $\mu\text{m}$  to 5  $\mu\text{m}$ .

Regarding claim 36, Nakamura et al. disclose the planar portions have a film thickness of 0.05  $\mu\text{m}$  to 0.5  $\mu\text{m}$ .

Regarding claim 42, Nakamura et al. disclose each of the quantum well layers has electrons and holes uniformly distributed therein, since electrons and holes are physical properties of the material it is inherently uniformly distributed therein, but not throughout.

Regarding claim 43, Nakamura et al. disclose each quantum well layer has a layer thickness of 10 nm or less, **see specification, page 2, line 11.**

Regarding claim 44, Nakamura et al. disclose the active layer consists essentially of nitrogen, indium and gallium, **see specification, page 2, lines 3-5.**

Regarding claim 45, Nakamura et al. discloses all of the structural requirement of the claim, therefore it is inherent that the laser of Nakamura will operate in the manner of a self-oscillating laser.

Regarding claims 46 and 47, It is inherent that the laser device of Nakamura et al. would be connected to a driving circuit for injecting an electric current, hence the need for electrodes **112 and 113**, and depending on the use of the laser device of Nakamura et al., such as for optical disks, it is inherent that the electric current is a modulated current having a modulation frequency of 300MHz, **see specification, page 3, lines 18-25.**



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Regarding claim 48, It is inherent that the optical output will modulate/vary when an electric current is injected thereto, due to a change in temperature of the laser device.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (5777350) in view of Larson (5767704). Nakamura et al., as applied to claim 34 above, teach all the stated limitations except for a driving circuit for injecting current into the semiconductor laser device wherein the electric current is modulated current and a modulation frequency of the current is 300 MHz or more. Larson teach a driving circuit for injecting current into the semiconductor laser device wherein the electric current is modulated current and a modulation frequency of the current is 300 MHz or more was well known in the art at the time the invention was made and was a requirement of the read mode to prevent the laser device from mode hopping, **see col. 1, lines 15-50**. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the driving circuit of Larson to the laser of Nakamura et al. to prevent the laser device from mode hopping.




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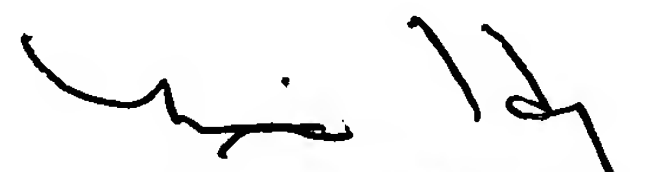
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cornelius H. Jackson whose telephone number is (571)272-1942. The examiner can normally be reached on 8:00 - 5:00, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
chj

  
MINSUN OH HARVEY  
PRIMARY EXAMINER